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| EXAMINER | |
|---|---|
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| ART UNIT | PAPER NUMBER |
|---|---|
| 1652 | 14 |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/917,378 | DING ET AL. | |
| | Examiner | Art Unit | |
| | Manjunath N. Rao, Ph.D. | 1652 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *24 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-13,26-34,43,44 and 63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,26-34,43,44 and 63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6,9* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

Claims 1-13, 26-34, 43-44 and 63 are now at issue and are present for examination.

### *Election/Restrictions*

Applicant's election of Group I, claims 1-13, 26-34, 43-44 and 63 in Paper No. 13 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement and cancelled all non-elected claims, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Drawings*

Drawings submitted in this application are accepted by the Examiner for examination purposes only.

### *Claim Objections*

Claims 4 and 5 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only and cannot depend from any other multiple dependent claim. See MPEP § 608.01(n).

Claims 1, 3, 6 and 31 are objected to because of the following informalities: Claims 1, 6 and 31 recite an abbreviations "GH5" (claim 1, 3 and 6), "GST" (claim 31) without providing respective expansions. Appropriate correction is required.

### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 10-11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 10-11 are directed to "a mannanase A peptide" which reads on a product of nature. Amending the claim to recite "an isolated or purified" to show the hand of man would overcome this rejection.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 and claims 2-9, 12-13 which depend from claim 1 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites the phrase "a substantially purified". The metes and bounds of the phrase "substantially purified" is not clear to the Examiner. A perusal of the specification did not provide a specific definition to the above phrase thus rendering the claim indefinite. As applicants provide a specific definition for the term "purified" amending the claim by deleting the term "substantially" would overcome this rejection.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 recites the limitation "first catalytic domain" in 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 is drawn to a composition of claim 1 further comprising amino acid sequences SEQ ID NO:3, 4 and 5. As these sequences independently are mannanase catalytic sequence, and cellulose binding sequences, it is not clear to the Examiner whether they are all linked together or whether they are present in the composition as independent amino acid sequences. If they are present as individual components as the claim implies, the utility of such a composition is also not clear to the Examiner.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 11 is drawn to a mannanase peptide defined as having a sequence of SEQ ID NO:2. However, according to the paper copy of the sequence listing SEQ ID NO:2 is a polynucleotide sequence. Therefore it is not clear to the Examiner as to whether applicants are claiming a polynucleotide encoding a mannanase or a mannanase polypeptide with a different SEQ ID NO. If applicants intend to claim the polynucleotide, claim 11 will be restricted out and included in group II.

Claims 12, 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 12 and 13 are directed to "an industrial mixture". It is not clear to the Examiner as what applicants mean by the above phrase. The question that arises is what is the type of industrial mixture. If applicants intend to claim an industrial detergent mixture amending the claim accordingly would overcome this rejection.

Claim 26 and claims 27-33 which depend from claim 26 are is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 26 is drawn to a polypeptide comprising a sequence of SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1; SEQ ID NO:2 or an amino acid sequence having at least 70% sequence identity with SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5 or SEQ ID NO:1. It is not clear to the Examiner whether applicants are claiming polypeptide comprising each of the above SEQ ID NO separately or whether they are claiming a single polypeptide comprising all the above SEQ ID NO.

Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 34 is drawn to "a mannanase-substrate complex comprising an isolated polypeptide molecule comprising a nucleic acid sequence encoding a heterologous protein in frame with the polypeptide molecule of SEQ ID NO:2 bound to hemi cellulose". The entire

claim is very confusing to the Examiner. It is not clear to the Examiner whether applicants are claiming a nucleic acid molecule or a complex of mannanase bound to hemi cellulose or a fusion protein. It is also not clear to the Examiner as to how a polypeptide molecule can comprise a *nucleic acid sequence encoding a heterologous protein.*

Claim 43 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 43 is drawn to "a composition comprising a carrier and a polypeptide molecule comprising a nucleic acid sequence encoding a heterologous protein in frame with the polypeptide molecule of SEQ ID NO:2". The entire claim is very confusing to the Examiner. It is not clear to the Examiner whether applicants are claiming a nucleic acid molecule or a polynucleotide or a fusion protein. It is also not clear to the Examiner as to how a polypeptide molecule can comprise a *nucleic acid sequence encoding a heterologous protein*.

Claim 63 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 63 is drawn to "a method for reducing hemi cellulose in a starting material wherein the method comprises administering an effective amount of a polypeptide molecule of claim 26 or an isolated polynucleotide molecule comprising a nucleic acid sequence encoding a heterologous protein in frame with the polypeptide molecule of SEQ ID NO:2". The entire claim is very confusing to the Examiner. It is not clear to the Examiner as to how a method of reducing hemi cellulose can be practiced using a polynucleotide molecule comprising a nucleic

acid sequence encoding a heterologous protein in frame with the polypeptide molecule of SEQ ID NO:2.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5, 12-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a composition comprising a purified mannanase A peptide wherein the mannanase A peptide comprises a catalytic domain with amino acid sequence SEQ ID NO:3, a carbohydrate binding domain III with SEQ ID NO:4 and a carbohydrate binding domain II with SEQ ID NO:5 in that specific order, does not reasonably provide enablement for a composition comprising a purified mannanase A peptide wherein the mannanase A peptide comprises any or all mannanase A, a carbohydrate binding domain III, a carbohydrate binding domain II from any or all sources

Factors to be considered in determining whether undue experimentation is required, are summarized in In re Wands (858 F.2d 731, 8 USPQ 2nd 1400 (Fed. Cir. 1988)) as follows: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claim(s).

Claims 1-5, 12-13 are so broad as to encompass any mannanase or any carbohydrate binding domains including variants, mutants and recombinants isolated from any source. The

scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of mannanases and carbohydrate binding domains broadly encompassed by the claims. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. However, in this case the disclosure is limited to the nucleotide and encoded amino acid sequence of a single mannanase and its respective carbohydrate binding domains with SEQ ID NO:3, 4, and 5 respectively.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims, and the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass all modifications and fragments of any mannanases, and carbohydrate binding domains because the specification does not establish: (A) a rational and predictable scheme for isolating and identifying mannanases and carbohydrate binding domains from any or all sources; (B)regions of the protein structure which may be modified without effecting either mannanase and/or

carbohydrate binding activity; (C) the general tolerance of mannanases and carbohydrate binding domains to modification and extent of such tolerance; (D) a rational and predictable scheme for modifying any mannanase and/or carbohydrate binding domains' amino acid residues with an expectation of obtaining the desired biological function; and (E) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any or all mannanases and carbohydrate binding domains. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of mannanases and carbohydrate binding domains having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See *In re Wands* 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claims 1-5, 12-13 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1-5, 12-13 are directed to composition of a purified mannanase A peptide wherein the mannanase A peptide comprises a catalytic domain, a carbohydrate binding domain III and a carbohydrate binding domain II in that specific order. Claims 1-5, 12-13 are rejected

under this section of 35 USC 112 because the claims are directed to a genus of polypeptides including modified polypeptide sequences, modified by at least one of deletion, addition, insertion and substitution of an amino acid residue that have not been disclosed in the specification. No description has been provided of all the polypeptide sequences encompassed by the above claims. No information, beyond the characterization of the function of the polypeptides with SEQ ID NO:3, 4, 5, and 1 has been provided by applicants which would indicate that they had possession of the claimed genus of modified polypeptides. The specification does not contain any disclosure of the structure of all the polypeptide sequences including fragments and variants within the scope of the claimed genus. The genus of polypeptides claimed is a large variable genus including peptides which can have a wide variety of structures. Therefore many structurally unrelated polypeptides are encompassed within the scope of these claims. The specification discloses only a single species of the claimed genus which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Therefore, one skilled in the art cannot reasonably conclude that applicant had possession of the claimed invention at the time the instant application was filed.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

Claims 26-33 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for polypeptides with SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1; and SEQ ID NO:2 and fusion polypeptides comprising the same, does not reasonably provide enablement for polypeptides which are 70% or 90% identical to SEQ ID

NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1 including mutants, variants and recombinants or fusion polypeptides comprising such polypeptides. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Factors to be considered in determining whether undue experimentation is required, are summarized in In re Wands (858 F.2d 731, 8 USPQ 2nd 1400 (Fed. Cir. 1988)) as follows: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claim(s).

Claims 26-33 are so broad as to encompass any polypeptide having 70% or 90% identity to the polypeptides SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1 which have specific activities such as mannanase activity and carbohydrate binding activity. The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of polypeptides broadly encompassed by the claims. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. However, in this case the disclosure is limited to the nucleotide

and encoded amino acid sequence of SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims, and the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass all modifications and fragments of any polypeptide with 70% or 90% identity to the mannanase and carbohydrate binding domains of SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1 because the specification does not establish: (A) regions of the protein structure which may be modified without effecting either mannanase or carbohydrate binding activities ; (B) the general tolerance of mannanase or carbohydrate binding domains to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any mannanase or carbohydrate binding domains' amino acid residues with an expectation of obtaining the desired biological function; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any or all polypeptides that are simply 70% or 90% identical

SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of mannanase and/or carbohydrate binding domains having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See *In re* Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claims 26-33 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 26-33 are directed to polypeptides that are either 70% or 90% identical to SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1 including variants, mutants and recombinants. Claims 26-33 are rejected under this section of 35 USC 112 because the claims are directed to a genus of polypeptides derived from SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1 including modified polypeptide sequences, modified by at least one of deletion, addition, insertion and substitution of an amino acid residue that have not been disclosed in the specification. No description has been provided of the modified polypeptide sequences encompassed by the claim. No information, beyond the characterization of SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1 has been provided by applicants which would indicate that they had possession of the claimed genus of modified polypeptides. The specification does not contain any disclosure of the function of all the polypeptide sequences

derived from SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1, including fragments and variants within the scope of the claimed genus. The genus of polypeptides claimed is a large variable genus including peptides which can have a wide variety of functions . Therefore many functionally unrelated polypeptides are encompassed within the scope of these claims. The specification discloses only a single species of the claimed genus which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Therefore, one skilled in the art cannot reasonably conclude that applicant had possession of the claimed invention at the time the instant application was filed.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Gibbs et al. (Appl. Environ. Micorbiol., 1992, Vol. 58(12):3864-3867). This rejection is based upon the public availability of a printed publication more than one year prior to the filing date of the instant application. Claims 1-5 of the instant application are drawn to a composition comprising a

substantially purified mannanase A peptide, wherein the mannanase peptide comprises a catalytic domain, a carbohydrate binding domain (CBD) III and a CBD II, wherein the mannanase further comprises a linker and a signal peptide and wherein the catalytic domain comprises an amino acid sequence that is about 370 to about 380 residues long and wherein the CBDs III and II are defined by a sequence of 140-160 and 90-110 amino acids respectively. Gibbs et al. disclose an identical composition comprising a mannanase catalytic domain linked to two CBDs (see the entire publication especially figure 2, panel C). Even though the reference does not disclose as to whether the CBDs are CBD III and CBD II. Examiner takes the position that the CBDs in the reference and the CBDs claimed are one and the same. Examiner also takes the position that the catalytic domain of the reference mannanase is about 370-380 amino acids and the CBDs are of 140-160 amino acids and 90-110 amino acids. Thus Gibbs et al. anticipate claims 1-5 of this application as written.

Since the Office does not have the facilities for examining and comparing applicants' protein with the protein of the prior art, the burden is on the applicant to show a novel or unobvious difference between the claimed product and the product of the prior art (i.e., that the protein of the prior art does not possess the same material structural and functional characteristics of the claimed protein). See In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and In re Fitzgerald et al., 205 USPQ 594.

Claim 26 is rejected under 35 U.S.C. 102(a) as being anticipated by Himmel et al. (Genseq database Accession No.AAB48786 or AAB 48787, 11-23-2000). This rejection is based upon the public availability of a printed publication. Claim 26 of the instant application is drawn

to a polypeptide comprising a sequence of SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1; SEQ ID NO:2 or an amino acid sequence having at least 70% sequence identity with SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5 or SEQ ID NO:1. Himmel et al. disclose an amino acid sequence that is more than 70% identical to SEQ ID NO :5. Therefore Himmel et al. anticipate claim 26 as written.

Claim 26 is rejected under 35 U.S.C. 102(b) as being anticipated by Himmel et al. (Genseq database Accession No.AAR89927, 10-8-1996). This rejection is based upon the public availability of a printed publication. Claim 26 of the instant application is drawn to a polypeptide comprising a sequence of SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5; SEQ ID NO:1; SEQ ID NO:2 or an amino acid sequence having at least 70% sequence identity with SEQ ID NO:3; SEQ ID NO:4; SEQ ID NO:5 or SEQ ID NO:1. Himmel et al. disclose an amino acid sequence that is more than 70% identical to SEQ ID NO :5. Therefore Himmel et al. anticipate claim 26 as written.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbs et al. as applied to claim1-5 above, and further in view of Liu et al. (US 6,126,698 10-3-2000). Claims

12-13 are drawn to industrial mixtures suitable for degrading hemi cellulose comprising the mannanase and a detergent. The reference of Gibbs et al. as it applies to the mannanases has been described above.

Liu et al. described the use of mannanase for degradation of hemi cellulose and a mixture of enzymes that can be used along with a detergent in textile industry for biopolishing of fabrics. Liu et al. also teach that CBDs confer high binding to cellulose targets and lead the enzyme to the interior depths of a cellulose fiber. With the reference of Gibbs et al. in hand disclosing a new multidomain mannanase comprising two CBDs, it would have been obvious to one of ordinary skill in the art to use such a mannanase in a industrial mixture as taught by Liu et al. One of ordinary skill in the art would be motivated to do so as the newly disclosed mannanase has two CBDs and would be an ideal candidate for such uses. One of ordinary skill in the art would have a reasonable expectation of success since Gibbs et al. provide the enzyme and Liu et al. readily provide a use for such an enzyme.

Therefore, the above invention would have been *prima facie* obvious to one of ordinary skill in the art.

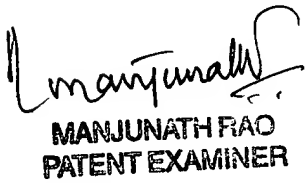
This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

***Conclusion***

None of the claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manjunath N. Rao, Ph.D. whose telephone number is 703-306-5681. The examiner can normally be reached on 7.30 a.m. to 4.00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy can be reached on 703-308-3804. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-4242 for regular communications and 703-308-4242 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0196.




Manjunath N. Rao
January 8, 2003